LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The great comet of September, 1882.

A MORE recent determination of the orbit of this comet than those mentioned in No. 57 of *Science* has been made, and the results may be of interest. To avoid (as far as may be) the errors which arise from the fact that different observers have observed various portions of the nucleus, it was thought best to take a series of observations made at a single observatory. A fine series of over one hundred observations made at Cordoba, and extending from Oct. 17, 1882, to June 1, 1883, was chosen. Up to Feb. 12, the same portion of the nucleus was observed: this portion afterwards became invisible, and then the estimated centre of the elongated nebulous mass was taken.

By comparing these observations with an ephemeris computed from a former orbit, three normal places were found, the four observations made in May and June being neglected. The dates of these normal places were Nov. 16.0, Jan. 3.0, and March 25.0. It is to be regretted that these observations did not begin in September, so that the first normal place might have been nearer the time of perihelion. Below is the derived system of elements, which is referred to the mean equinox of 1883.0, Greenwich M.T.

T	Sept. 17.2637		
π	55°	2′	16 59″
Ω	345	43	55.01
i	141	54	31.54
ϕ	89	13	55.8
log e	9.9999610		
log q	7.8821773		
log a	1.9289		
Period	782.4 years.		
Perihelion distance	707,500 miles.		
Semi-major axis	7,878,000,000 "		
Semi-minor axis	105,600,000 "		

These elements satisfy the second normal place very closely, the residuals being —

$$\Delta \lambda \cos \beta = + 0.02''; \ \Delta \beta = + 0.02''.$$

If the period be assumed as 751 years, on the assumption that the comet appeared in 370 B.C. and 1132 A.D., and the foregoing perihelion distance be accepted, the logarithm of the eccentricity must be 9.9999599, which is 0.0000011 less than the value given above.

It is the intention of the writer to combine all the reliable observations which have been made, in the hope of obtaining a fair orbit for this perplexing object.

H. A. HOWE.

University of Denver,
March 11.

Atmospheric wave from Krakatoa.

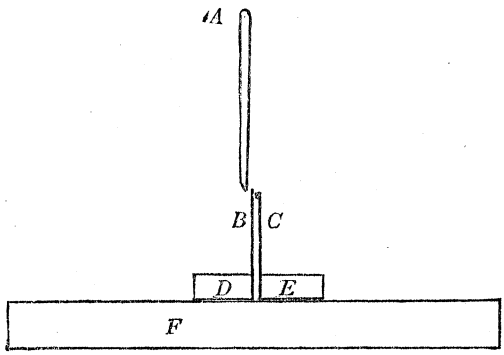
Granting, as stated in *Science*, iii. 338, that an atmospheric wave passing over the entire world was caused by the great eruption in the Straits of Sunda, would not its greatest effect be observable at the opposite extremity of the diameter of the earth, or near the northern extremity of South America? The wave would doubtless pass away from its origin in all conceivable directions, its front forming the arc of a small circle, constantly enlarging until it became a great circle, after which it would contract, converging as to a focus on the opposite side of the earth, producing a magnified effect; after which it would return as from a second origin.

W.

Hoboken, March 16.

Electric time-signals.

The devices, recently described in *Science*, by which a clock is made to close an electric circuit at regular intervals, prompt me to describe a very simple one which I have found entirely satisfactory. It is applied to a tower-clock as follows: to the arbor carrying the minute-hand, at the end *A*, opposite the dial, is screwed a slender brass arm about five inches in length, extending down to two light metallic springs, *B C*. The brass arm at the proper moment comes in contact with *B*, and moves it forward till it touches



the platinum point on *C*. The electric circuit is then closed, as *B* and *C* are soldered to two brass blocks, *D E*, to which the wires of the circuit are attached. These blocks are screwed fast to a piece of wood, *F*, which is in turn secured to the clock-frame by set screws. It will be observed that the current does not pass through the works of the clock. The appliance can be made to close the circuit at any portion of the hour by simply loosening the movable hand at *A*, and fastening it so that it shall bring the two springs together at the required minute. This arrangement has not failed once in a year and a half on a circuit including nine bells.

H. S. CARHART.

Evanston, Ill., March 17.

Is material contact possible?

Dr. John Robison, the eminent Scottish physicist, discussing 'Newton's rings' (about 1795), concluded that to produce the central 'black spot' between two glasses required a pressure of about a thousand pounds to a square inch; the separation at this place being still about $\frac{1}{250000}$ of an inch. Dr. Thomas Young (about 1805) found that the phenomenon does not depend on the presence of air. By the general consensus of physicists this has been accepted as a striking evidence that molecular resistance to absolute contact is insuperable.

Sir William Thomson, in a Friday evening lecture at the Royal institution of Great Britain, delivered Feb. 2, 1883, said, however, very emphatically, "I do not believe that for a moment. The seeming repulsion comes from *shreds or particles of dust between them*" (*Proc. Roy. inst.*, Feb. 2, 1883, x. 189; *Nature*, June 28, 1883).

As a question of fact, this is one of very great importance; and it surely deserves a critical and decisive determination by some of our well-equipped physicists. The investigation, though a very delicate and refined one, is quite within the resources of modern experimentation. The physical problem is, can the 'black spot' between perfectly clean plates be produced without sensible pressure?

W. B. T.